FUEL RELATED PROBLEMS

What's In the Gas?

PREMATURE FUEL PUMP FAILURE

When you encounter multiple fuel pump failures on the same vehicle, there is a good possibility that contaminated fuel may be the reason for the repeated failures. We have all replaced fuel pumps that failed within a few days or weeks. Most blame the fuel pump manufacturer for poor quality products and give little consideration to the conditions that could promote fuel pump failures. Let's consider some conditions that can promote premature failure:

1) ***Low fuel level…*** the fuel is the coolant for the fuel pump. Operating a vehicle on a low fuel level promotes overheating of the fuel pump and premature failure.

2) ***Fuel tank contamination…*** keeping the fuel tank clean and free of contaminates helps eliminate fuel pump failure and/or performance related symptoms. Moisture in the system promotes electrical connector/conductor corrosion.

3) ***Fuel filter restriction…*** a restricted fuel filter promotes premature fuel pump failure due to overheating of the pump and performance related symptoms due to a loss of fuel pressure and/or volume.

Keeping the fuel filter changed is imperative in maintaining the performance of the vehicle, and most of all protecting the fuel system components from damage due to contamination. This simple maintenance step may prevent the replacement of a costly electric fuel pump or some expensive fuel injectors. With some of the newer vehicles it is not uncommon for the replacement cost of the fuel pump to reach several hundred dollars, plus two hours of labor time to make the replacement.

When changing the filter may not be enough: Delphi recently performed a study on fuel pumps returned under warranty. One evaluation involved a vehicle that encountered two fuel pump failures within a week. The symptoms involved noisy fuel pump operation and erratic fuel pressure. Analyzing both fuel pump modules revealed that the module bucket and internal strainer were both heavily contaminated with rust. The external strainers reflected some discoloration, but only a minimal amount of contamination. Examining the fuel tank only reflected a minute amount of contaminates. It was determined that the rust accumulation was coming from the return fuel line and was being deposited in the fuel module bucket. On this application the return line puts the return fuel directly into the module bucket instead of directly into the fuel tank. The fuel filter could not catch the rust because it was developing in the return line downstream of the fuel filter.

Replacing a fuel pump/module on a vehicle that incorporates a heavy accumulation of rust or deposits in the fuel tank almost guarantees premature fuel pump failure. Make certain the tank is properly cleaned and any deteriorated fuel lines are replaced prior to installing a new fuel pump/module. Also, examine all electrical connectors for evidence of poor connections or overheated connectors, which may give the symptoms of a defective fuel pump.

SULFUR CONTAMINATION

GM acknowledges that their passenger cars and trucks may encounter erratic fuel gauge readings or a false catalytic converter diagnosis due to fuel with a high sulfur content.

The amount of sulfur in the gasoline must meet Federal guidelines that limit the amount of sulfur in the fuel to 80 parts per million (PPM), with the exception of California, which limits the amount to 30 PPM. Some additional exceptions include an allowance for qualifying refineries that may permit up to 450 PPM for a limited amount of time. Most of these exceptions expired January 1, 2011.

Foul Odor… Complaints of a foul sulfur odor have prompted some technicians to replace the catalytic converter, assuming it to be defective. This is not recommended as a cure for the foul odor. When a customer complains of the foul sulfur odor, they should be advised to first switch the brand of fuel they are purchasing. Most of the time this will eliminate the odor condition, providing the new fuel is within the 80 PPM

sulfur limit. It may be necessary to consume a tank of the lower sulfur content fuel to totally eliminate the odor. GM recommends Top Tier Brands of fuel for these symptoms. Companies that are certified as Top Tier Brands can be determined by accessing the following website…**www.toptiergas.com.** The Top Tier rating is a voluntary program where petroleum companies can have their fuel designated by the auto manufacturers as meeting certain required detergent levels. This process involves a certification or registration of compliance to certify the fuel with the vehicle manufacturers.

Sulfur Disrupts Electrical Continuity… GM has acknowledged that erratic fuel gauge readings may be the result of sulfur contamination, which disrupts the electrical continuity of the fuel sending units. The sulfur in the fuel forms a corrosive effect on the electrical components, resulting in inaccurate fuel tank level readings. GM recommends adding their Fuel System Treatment Plus (Mighty's Syntramax SB304) to the fuel tank (gas engines) during or near each oil change interval. The mentioned chemical should be added to a full tank of gasoline to protect the fuel system sending units from the corrosive elements of the sulfur. In addition, the chemical will help remove harmful engine deposits that can affect engine performance, fuel economy and emission output.

E85 FUEL COMPATIBILITY

Flex Fuel vehicles are capable of operating on gasoline or a mixture of 85% ethanol and 15% gasoline, which is referred to as E85. When we think of E85 fuel we usually associate the ethanol with corn based stock. The fact is… ethanol can be produced from almost any plant material, as all plants contain sugar, which can be fermented to manufacture ethanol. Much of this has to do with logistics, availability of plants, growing seasons, ease of growth and even soil types, which can determine the type and volume of plant growth required for ethanol production.

With the cost of gasoline on the constant increase, some consumers are questioning if their non-E85 compatible vehicle can burn the E85 fuel, as it is cheaper than the regular grade gasoline. Your response should be ***absolutely not.*** Explain that the fuel system components for E85 rated fuel incorporate special metals and coatings to prevent corrosion. Also, additional sensors and electronic adjustments by the PCM are required to burn the E85 fuel. Following are symptoms that can be expected when fueling a non-Flex Fuel vehicle with E85 fuel:

1) Lean driveability symptoms including hesitation, surging and stalling.
2) Fuel Trim System Lean codes PO171 and PO174 stored in memory.
3) Random misfire codes (PO300).
4) Oxygen sensor codes.
5) Improper transmission shifting.
6) Fuel system corrosion.
7) Disabled Traction Control or Stability System messages stored in memory.

E85 fuel is comprised of 85% ethanol and 15% gasoline. The 15% of gasoline is required to insure normal operation during cold climate conditions, as straight alcohol does not perform well during cold conditions. Gasoline engines are designed to run on a maximum of 10% ethanol. Fuel containing greater than this amount of ethanol can result in driveability issues, in addition to increased fuel system corrosion.

While E85 is priced lower than gasoline, you must consider that E85 fuel has approximately 27% less energy per gallon compared to gasoline; therefore it may cost more to burn E85 fuel. This will be dependent on the price of a gallon of E85 fuel. Let's consider an F150 Ford truck equipped with Flex Fuel and assuming a price of $3.16 per gallon for E85 and $3.74 per gallon for gasoline. The average fuel economy rating using E85 is 11.5 mpg and 16.2 mpg with gasoline. Based on an average of 15,000 miles driven per year, the cost to drive the vehicle fueled with E85 would be (even dollars) $4,121 per year versus the cost of gasoline at $3,463 per year.

It is not cost effective to modify a non-Flex Fuel vehicle to run on E85 fuel. Special components, metals and coatings are required, as the alcohol will attack unprotected metal components, resulting in corrosion and contamination. The best feature of the E85 fuel is that it is a renewable energy and we become less dependent on foreign oil.

In you suspect a non-Flex Fuel vehicle has been filled with E85 fuel, make certain you perform an alcohol content test. Test kits are available to measure the percent of alcohol in the fuel, and it is a simple test procedure. If the alcohol content exceeds 10%, the fuel tank should be drained and refilled with gasoline.

LARRY HAMMER
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